WHAT IS CLAIMED IS:

1. A method for forming an array of viable cells, said method comprising ink-jet printing a cellular composition containing cells onto a substrate, wherein at least about 25% of said cells remain viable on said substrate after incubation for 24 hours at 37°C in a 5% CO_2 / 95% O_2 environment.

2. A method as defined in claim 1, wherein an ink-jet printer containing at least one printer head is used to print said cellular composition onto said substrate.

3. A method as defined in claim 2, wherein said printer head defines at least one orifice through which said cellular composition is capable of flowing.

4. A method as defined in claim 3, wherein said orifice is positioned from about 0.1 to about 30 millimeters from said substrate.

5. A method as defined in claim 3, wherein said orifice is positioned from about 0.5 to about 3 millimeters from said substrate

6. A method as defined in claim 3, wherein said orifice has a size sufficient to inhibit substantial clogging of said cellular composition within said printer head.

7. A method as defined in claim 2, wherein a pressurization actuator facilitates the formation of a droplet of said cellular composition.

8. A method as defined in claim 7, wherein said pressurization actuator receives a voltage pulse ranging from about 1 to about 50 volts.

9. A method as defined in claim 7, wherein said pressurization actuator receives a voltage pulse ranging from about 10 to about 20 volts.

10. A method as defined in claim 7, wherein said pressurization actuator is selected from the group consisting of piezoelectric crystals, acoustic devices, thermal devices, and combinations thereof.

11. A method as defined in claim 1, wherein said cellular composition contains procaryotic cells.

12. A method as defined in claim 1, wherein said cellular composition contains eucaryotic cells.

13. A method as defined in claim 1, wherein said cellular composition contains cell aggregates.

14. A method as defined in claim 1, wherein the concentration of said cells within said cellular composition is from about 1×10^3 to about 1×10^{16} cells per milliliter.

15. A method as defined in claim 1, wherein the concentration of said cells within said cellular composition is from about 3×10^5 to about 1×10^9 cells per milliliter.

16. A method as defined in claim 1, further comprising depositing a support compound onto said substrate.

17. A method as defined in claim 16, wherein said support compound is a gel or a compound capable of forming a gel.

18. A method as defined in claim 17, wherein said support compound forms a gel after being deposited onto said substrate.

19. A method as defined in claim 17, wherein said support compound is crosslinked after being deposited onto said substrate.

20. A method as defined in claim 19, wherein the crosslinking is induced by immersing said substrate into a solution containing said support compound or a crosslinking agent for said support compound.

21. A method as defined in claim 16, wherein said support compound is printed onto said substrate.

22. A method as defined in claim 21, wherein said support compound is mixed with said cellular composition prior to being printed onto said substrate.

23. A method as defined in claim 16, wherein said support compound is selected from the group consisting of agar, collagen, hydrogel polymers, and combinations thereof.

24. A method as defined in claim 1, wherein a two-dimensional array of said cells is formed on said substrate.

25. A method as defined in claim 1, wherein a three-dimensional array of said cells is formed on said substrate.

26. A method as defined in claim 1, further comprising ink-jet printing multiple droplets of said cellular composition onto said substrate.

27. A method as defined in claim 26, wherein said multiple droplets fuse into a cohesive cellular assembly.

28. A method as defined in claim 26, wherein said multiple droplets are printed in multiple printing passes.

29. A method as defined in claim 1, wherein at least about 50% of said cells remain viable on said substrate after incubation for 24 hours at 37°C in a 5% CO_2 / 95% O_2 environment.

30. A method as defined in claim 1, wherein at least about 75% of said cells remain viable on said substrate after incubation for 24 hours at 37°C in a 5% CO_2 / 95% O_2 environment.

31. A method as defined in claim 1, wherein at least about 85% of said cells remain viable on said substrate after incubation for 24 hours at 37°C in a 5% CO_2 / 95% O_2 environment.

32. A method as defined in claim 1, wherein the density of said cells on said substrate is from about 0.1 to about 2 cells per square millimeter.

33. A method as defined in claim 32, wherein the density of said cells on said substrate is from about 0.25 to about 1 cell per square millimeter.

34. A method as defined in claim 1, wherein the density of said cells on said substrate is from about 0.0001 to about 1 cell per square micrometer.

35. A method as defined in claim 34, wherein the density of said cells on said substrate is from about 0.0004 to about 0.25 cells per square micrometer.

36. A method for forming an array of viable cells, said method comprising:

supplying a cellular composition containing cells to at least one printer head of an ink-jet printer, said printer head defining an orifice through which said cellular composition is capable of flowing;

forming one or more droplets from said cellular composition;

flowing the droplets through said orifice so that said cells are printed onto said substrate; and

depositing a support compound onto said substrate for supporting said cells, said support compound including a gel or a compound capable of forming a gel.

37. A method as defined in claim 36, wherein said cellular composition contains eucaryotic cells, procaryotic cells, or combinations thereof.

38. A method as defined in claim 36, wherein said support compound forms a gel after being deposited onto said substrate.

39. A method as defined in claim 36, wherein said support compound is crosslinked after being deposited onto said substrate.

40. A method as defined in claim 39, wherein the crosslinking is induced by immersing said substrate into a solution containing said support compound or a crosslinking agent for said support compound.

41. A method as defined in claim 36, wherein said support compound is printed onto said substrate.

42. A method as defined in claim 41, wherein said support compound is mixed with said cellular composition prior to being printed onto said substrate.

43. A method as defined in claim 36, wherein said support compound is selected from the group consisting of agar, collagen, hydrogel polymers, and combinations thereof.

44. A method as defined in claim 36, wherein a two-dimensional array of said cells is formed on said substrate.

45. A method as defined in claim 36, wherein a three-dimensional array of said cells is formed on said substrate.

46. A method as defined in claim 36, wherein multiple droplets are printed onto said substrate.

47. A method as defined in claim 46, wherein said multiple droplets fuse into a cohesive cellular assembly.

48. A method as defined in claim 36, wherein at least about 25% of said cells remain viable on said substrate after incubation for 24 hours at 37°C in a 5% CO_2 / 95% O_2 environment.

49. A method as defined in claim 36, wherein at least about 50% of said cells remain viable on said substrate after incubation for 24 hours at 37°C in a 5% CO_2 / 95% O_2 environment.

50. A method as defined in claim 36, wherein at least about 75% of said cells remain viable on said substrate after incubation for 24 hours at 37°C in a 5% CO_2 / 95% O_2 environment.

51. A method as defined in claim 36, wherein at least about 85% of said cells remain viable on said substrate after incubation for 24 hours at 37°C in a 5% CO_2 / 95% O_2 environment.

52. A method as defined in claim 36, wherein the density of said cells on said substrate is from about 0.1 to about 2 cells per square millimeter.

53. A method as defined in claim 36, wherein the density of said cells on said substrate is from about 0.0001 to about 1 cell per square micrometer.

54. An array formed on a substrate from viable printed cells, wherein a gel provides structural support for said viable printed cells, wherein the density of said cells when printed is from about 0.0001 to about 1 cell per square micrometer.

55. An array as defined in claim 54, wherein said gel is crosslinked.

56. An array as defined in claim 54, wherein said gel is selected from the group consisting of agar, collagen, hydrogel polymers, and combinations thereof.

57. An array as defined in claim 54, wherein at least about 50% of said cells remain viable after incubation for 24 hours at 37°C in a 5% CO_2 / 95% O_2 environment.

58. An array as defined in claim 54, wherein at least about 75% of said cells remain viable after incubation for 24 hours at 37°C in a 5% CO_2 / 95% O_2 environment.

59. An array as defined in claim 54, wherein at least about 85% of said cells remain viable after incubation for 24 hours at 37°C in a 5% CO_2 / 95% O_2 environment.

60. An array as defined in claim 54 wherein the density of said cells when printed is from about 0.0004 to about 0.25 cells per square millimeter.

61. An array as defined in claim 54, wherein said cells comprise procaryotic cells.

62. An array as defined in claim 54, wherein said cells comprise eucaryotic cells.

63. An array as defined in claim 54, wherein the array comprises cells of more than one cell type.

64. An array as defined in claim 54, wherein the array is two-dimensional.

65. An array as defined in claim 54, wherein the array is three-dimensional.

66. An array as defined in claim 54, wherein the printed cells form a cohesive cellular assembly.

67. An array as defined in claim 54, wherein the density of said cells when printed varies across at least a portion of the array.

68. An ink-jet printer configured to deposit viable cells onto a substrate, said printer comprising:

a reservoir for containing the cells;

a printer head in fluid communication with said reservoir, said printer head defining an orifice having a size of from about 2 to about 200 micrometers, wherein the cells are capable of flowing through said orifice without substantial clogging; and

a pressurization actuator that is capable of facilitating the formation of a droplet containing the cells for flowing through said orifice, wherein said pressurization actuator receives a voltage pulse that is sufficiently low to facilitate the survival of the cells.

69. An ink-jet printer as defined in claim 68, wherein said voltage pulse ranges from about 1 to about 50 volts.

70. An ink-jet printer as defined in claim 68, wherein said voltage pulse ranges from about 10 to about 20 volts.

71. An ink-jet printer as defined in claim 68, wherein said pressurization actuator is selected from the group consisting of piezoelectric crystals, acoustic devices, thermal devices, and combinations thereof.

72. An ink-jet printer as defined in claim 68, wherein said printer head is moveable in an -x direction.

73. An ink-jet printer as defined in claim 68, further comprising a feed mechanism for receiving the substrate.

74. An ink-jet printer as defined in claim 73, wherein said feed mechanism is configured to move the substrate in a -y direction.